

UV/EB Market Trends

By Gary Cohen

RadTech NA conducted a Member Market Trend Survey in April 2012, the results of which were presented at the RadTech 2012 Conference and Exhibition.

Articles found in the “Radwire” section of the RadTech website (www.radtech.org) highlight emerging trends in UV/EB:

- Stain-Resistant Fabrics
- Conductive Films
- Flexible Solar Cells
- High School Student Reduces Kevlar Processing From Day(s) to Minutes with UV
- Carbon Fiber UV Sealer
- UV Enables Lightest Structure Ever

These are just a few of the exciting activities in the UV/EB market space. With increased government and corporate emphasis on new innovation, novel materials, emerging energy technologies and sustainability, opportunities for UV/EB technology

seem to be expanding rapidly. Fast, precise and efficient processing characteristics, and the ability to adapt to new manufacturing opportunities while saving energy and greatly reducing harmful emissions are positioning UV/EB as an enabling tool for industries looking to incorporate more responsible manufacturing methods.

This paper highlights the results of RadTech’s biennial UV/EB market survey. While the RadTech survey results typically exhibit some optimism for future usage of UV/EB, this survey pointed to the emergence of new opportunities as well as renewed awareness from traditional applications, with current end-user interest and inquiries at a high level.

A recent Ink World/Coatings World survey sponsored by Rodman Publishing also had similarly positive results. That survey found that between one-third to one-half of its readers are already working in UV/EB; with another one-third to one-half of those who are not already in the technology planning to move to UV/EB in the future. Speed; better physical properties; reduced volatile organic compounds (VOCs); and a high benefit/cost ratio were most often cited by survey respondents as reasons for their interest.

Indeed, an article on “Sustainability in the Flexo Industry 2012” on www.flexomag.com (a publication of the Flexographic Technical Association) points to a “shift from solvent to UV/EB”—with 31% of flexible packaging printers and 87% of label printers indicating they already use the technology. The RadTech survey,

FIGURE 1

UV/EB-formulated product usage in North America (metric tons)

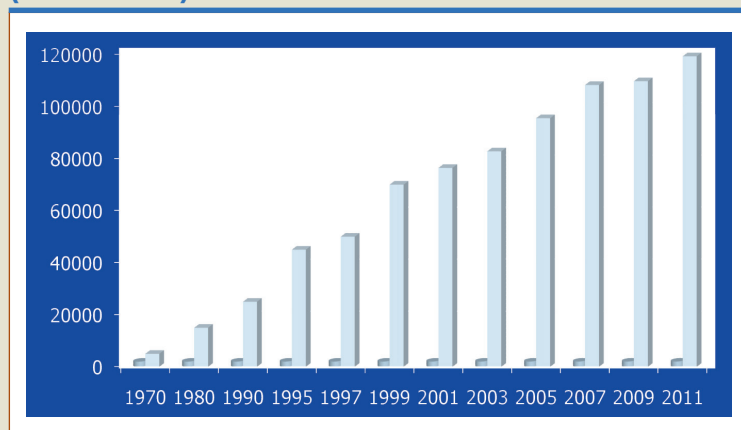


FIGURE 2

Forecasted growth for the next three years

UV/EB applications expected to grow at 7% or above per year for the next 3 years

- 3D inkjet/stereolithography
- Barrier for conductive films and flex electronics
- Inkjet
- Plastic and metal coatings
- Electronics
- Photovoltaics
- Field-Applied UV
- Sprayable 3D Coatings
- Waterbased UV/EB
- UV for fingernails

meanwhile, found that 80% of survey respondents indicated inquiries and sales leads were up over the last quarter of 2011.

In 2011, UV/EB-formulated product usage in North America increased 9% over the two-year period 2010 to 2011 to about 119,000 metric tons. (Please note that this survey is conducted only every two years in conjunction with the biennial RadTech Conference and Exhibition). This increase continues an uninterrupted string of growth since 1970. The 2010 survey found that during the recent recession, yearly growth managed just over 1%. However, prior to that, between the 2002 to 2008 survey years, average biennial increases were more than 12%. (See Figure 1.)

RadTech survey results show average anticipated annual growth of UV/EB to accelerate to about 7% over the next three years. The list shows UV/EB applications that are expected to grow at or above 7% per year for the next three years. Applications for inkjet, 3D inkjet, stereolithography, rapid prototyping and desktop

manufacturing are anticipated to show the most rapid gains as these technologies take off. Survey responses showing annual growth rates of 20 to 50% per year for these categories were not uncommon. (See Figure 2.)

The distribution of UV/EB-formulated product usage in North America has not shifted significantly over the last several years, with graphic arts overprint varnish (OPV) the largest single application.

Combined with inks, graphic arts represent about one-half of the total UV/EB market in North America. The only market shifts noted in this survey include one percentage point decreases in the shares of wood and printing plate usage of UV/EB, and a corresponding increase in “all other.” The predominance of graphic arts in North America contrasts with the largest markets for UV/EB in other regions, which include wood and bamboo finishing in China; electronics in Japan; and industrial wood and paper in Europe. (See Figure 3.)

In recent surveys, Brazil, Russia, India and China generally represent the fastest growing opportunities for UV/EB, according to survey respondents. The notable exception in this survey is Russia, which had appeared as a top market in past surveys but was not included in the top 10 this time. The United States is still reported as an “emerging market” by many survey respondents—with several expressing optimism of continued high growth rates vis-à-vis the rest of the world. Mexico jumped to the top five. With recent reports concerning “re-shoring” or a return of manufacturing from Asia, it is reported that much of that may be re-directed

FIGURE 3

UV/EB formulated product market in North America

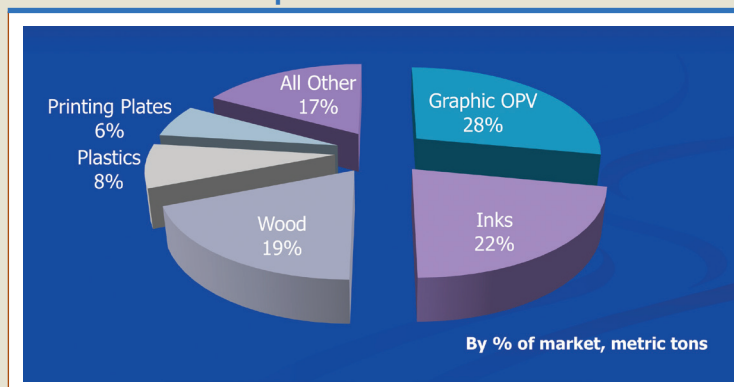


FIGURE 4**Fastest emerging users of UV/EB technology****FIGURE 5****Motivations for using UV/EB**

1. Increase Productivity (1)
2. Improve Physical Properties/Performance (3)
3. Environmental Benefits (4)
4. Lower Energy Costs (2)
5. Reduce Floor Space (--)

(Numbers in parenthesis represent ranking in 2012 survey.)

to Mexico, perhaps helping to explain these results. Vietnam and Turkey are also included in the top 10 for the first time. (See Figure 4.)

As has been the case for several years, “increased productivity” is by far the top motivation for using UV/EB. Lower energy costs, which had been ranked second in the last survey, has fallen to fourth—while UV/EB applications typically offer substantial energy savings, the lower ranking is perhaps an indication that new oil and gas production in North America is reducing longer term concerns. Environmental benefits continue to be seen by the industry as an important

characteristic of the UV/EB processes, but is typically not an ultimate decision factor in moving to the process.

However, the continued emphasis on “sustainability,” as companies intensify efforts to develop efficient, responsible products and processes, positions UV/EB as an important potential enabling process. Reduced floor space—a well-known benefit as the technology eliminates drying equipment and/or areas as well as pollution control devices—is listed in the top five for the first time, perhaps reflecting the emphasis on production efficiencies. (See Figure 5.)

UV/EB OPV for graphic arts is the single largest application for the technology (by volume) in North America. Formulated product usage of OPV in 2011 reached 33.5 thousand metric tons, up just over 9% for the two years. OPV is composed of “general purpose” accounting for about 90% of the total; with the remainder classified as “specialty” (e.g., contains anti-slip functionality). (See Figure 6.)

UV/EB inks is the next largest category of formulated product usage in North America, increasing 8% to 26.2 thousand metric tons in 2011. (See Figure 7.) Offset (litho) remains

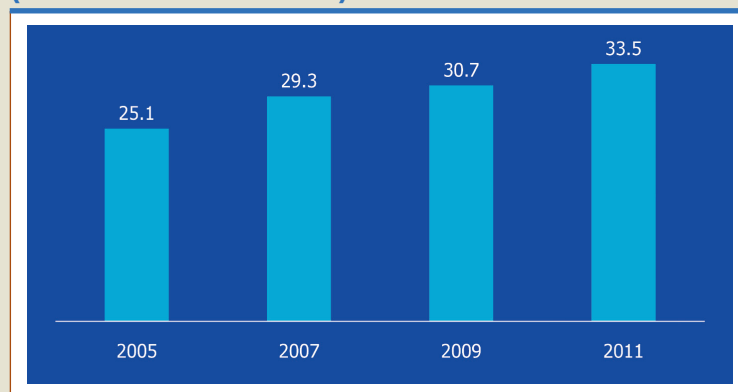
FIGURE 6**UV/EB graphic arts OPV usage (thousands metric tons)**

FIGURE 7

UV/EB inks usage (thousands metric tons)



the largest category of inks, at 9.9 thousand metric tons. However, as a share of the ink total, litho has fallen with inkjet and flexo inks growing at a faster pace. In 2011, flexo increased more than 10% and now accounts for about one-third of the total. Inkjet jumped up by 42%, but still accounts for less than 10% of the total inks. *InfoTrends* predicts strong growth in wide-format UV inkjet, jumping 63% in the period between 2012 and 2015 to \$3.1 billion. While UV is well-established in screen inks, the volume of UV screen inks used has declined

after peaking in 2007, reflecting market trends in the ink industry.

UV/EB usage of wood finishes has reached 23.2 thousand metric tons in 2011, accounting for an estimated 19% of UV/EB-formulated product usage in North America, which is down slightly from 20% during the last survey. After falling in the 2009 survey, usage was up by 7% over the two-year period of 2010-2011. Clear finishes account for more than one-third of the total, reaching 8,000 metric tons. Stains and sealers represent the fastest growing application, but that started from a small base—up 14% to 1.6 thousand metric tons. Penetration into the

FIGURE 8

UV/EB wood finishes usage (thousands metric tons)

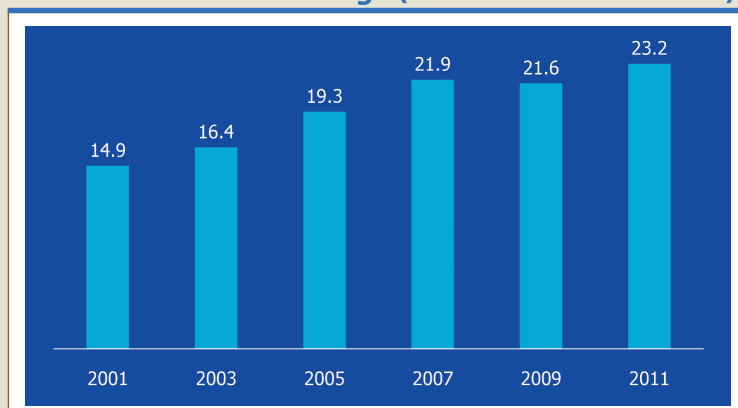
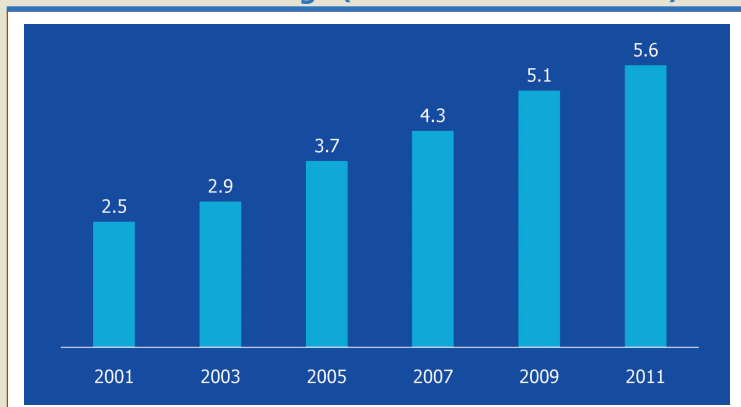


FIGURE 9

UV/EB adhesives usage (thousands metric tons)



prefinished flooring market rose by 11% to 3,000 metric tons. (See Figure 8.)

Adhesives gained 12% in UV/EB-formulated product usage during 2010-2011—to 5.6 thousand metric tons. Optical adhesives remain a small-volume but high-value and growing segment of the market, up 17%. Laminating adhesives, the largest component of this category by volume, reached 5,000 metric tons, up 12%. After considerable interest several years ago, pressure-sensitive adhesives usage has been flat for the last few years. However, suppliers report

FIGURE 10**UV/EB metal finishes usage (thousands metric tons)**

renewed interest among potential users. (See Figure 9.)

Although still small, metal coatings is one of the fastest growing applications for UV/EB, with considerable efforts underway in several potential areas. Survey results show UV/EB for metal finishes up more than 17% to 1.1 thousand metric tons. Pipe and tube usage accounts for the bulk of this category. (See Figure 10.)

After remaining flat for the past several years, metal decorating (specifically, can coatings) increased more than 10% in 2011 to 2.7 thousand metric tons (not included in graph). Overprint varnish is the largest and fastest growing component of this segment, with solid growth also recorded for metal finishing inks.

With significant interest in the use of LEDs for UV-curing applications,

this survey for the first time asked respondents to provide their outlook for its adoption. More than 40% of survey respondents indicated they are in some way working with or have an interest in LEDs, with 47% asserting that UV-LEDs will one day enable new applications for UV curing that cannot be currently served by existing technology. Technical limitations of UV-LED equipment and the lack of available formulations were cited as the main current obstacles to widespread adoption. Survey respondents indicated that within five years, digital inkjet, screen inks, flexo inks, adhesives and field-applied coatings will become commonplace applications for UV-LEDs.

For regular updates on UV/EB, please visit www.radtech.org. ■

—Gary Cohen is executive director of RadTech North America.

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